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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,025

01/30/2007

Gereon Vogtmeier

PHDE030403US

1832

38107

7590

12/02/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
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EXAMINER

ARTMAN, THOMAS R

ART UNIT

PAPER NUMBER

2882

MAIL DATE

DELIVERY MODE

12/02/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/596,025	<b>Applicant(s)</b> VOGTMEIER, GEREON	
	<b>Examiner</b> THOMAS R. ARTMAN	<b>Art Unit</b> 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, 6, 12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Vekstein (US 5,134,639).

Regarding claims 1 and 12, Vekstein discloses a CT device having a detector arrangement (Fig.1), including:

- a) at least one detector module 18 having a plurality of individual detector elements,
- b) an electrical unit 23, 24 for processing the signals of the detector elements, and
- c) an electro-optical transducer 26a-26d for generating optical detector module output signals.

With respect to claim 3, Vekstein further discloses that the electrical unit has an opto-electrical transducer 37a and 37b that supplies input signals to the detector modules 18 (col.6, lines 31-34).

With respect to claims 4 and 14, Vekstein further discloses that the opto-electrical transducers include photodiodes 53 and that the electro-optical transducers include LEDs 51 that generate signals indicative of the signals produced by the detector elements.

With respect to claim 6, it is inherent in Vekstein that the detector modules have a detector chip upon which the detector elements are formed.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vekstein, as applied to claim 1 above.

With respect to claim 2, Vekstein additionally discloses that the electrical unit (23, 24 and 26a-26d) includes a parallel-to-serial converter 24 for generating a serial detector module output signal.

Vekstein does not specifically disclose that the electrical unit includes an ADC. However, Vekstein does teach that an ADC is included in the electrical units 28a and 28b in order to digitize the detector signals for input to the image processor.

One skilled in the art will readily appreciate that the signal to noise ratio of digital data is inherently better than analogue signals.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Vekstein to include ADCs in the electrical unit in order to transmit the detector signals in digital form, rather than analogue. The improved signal to noise ratio thus improves the integrity of the data, as is known in the art.

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With respect to claim 16, Vekstein does not specifically disclose laser diodes. Vekstein teaches LEDs.

However, it is known in the art to use laser diodes in lieu of LEDs because of their higher intensity output, providing an improved signal-to-noise ratio and overall signal integrity compared to LED output.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Vekstein to use laser diodes for improved signal quality as is known in the art.

Claims 5, 7-11, 13, 15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vekstein, as applied to claims 1, 6 and 12 above, respectively, in view of Tsang et al. (Ref#2 from IDS filed May 25<sup>th</sup>, 2006).

With respect to claim 13, Vekstein additionally discloses that the detector arrangement 18 is arranged on a rotatable part of a gantry, the processing unit 29/33 is arranged in a stationary configuration, where the detectors and processing unit communicate wirelessly via optical means.

With respect to claims 5, 7-11, 15, 17-20, and further regarding claim 13, Vekstein does not additionally disclose that the electrical unit is integrated with the detector module, thus requiring that the detector modules are coupled to optical fibers, where the communications operate through an optical fiber infrastructure.

Tsang specifically teaches the practice of integrating electro-optic transducers with detector module electronics (CMOS chips; Fig.11(c)) in order to transfer the detector data through optical fiber infrastructures, rather than copper wires, in order to improve the detector

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modules in several ways: reduced mass-volume since optical fibers are lighter than copper wires; improve bandwidth, which reduces the number of wires/fibers needed and thus allows for faster sampling rates; immunity to EMF and other sources of noise; and provide a high radiation resistance (col.2 of pp.3844). The integration of the electro-optic devices with the detector modules eliminates the massive amount of electronic devices and cables (col.1 of pp.3853). Tsang further discloses the use of an optical fiber backplane (Fig.3) for forming the optical connections.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Vekstein to use optical fiber-based communications with electro-optic transducers integrated with the detector modules, in order to realize the myriad benefits of optical fiber-based communication.

Further regarding claim 8, for the electro-optic device to be integrated, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the module carrier has space for the electrical unit and a duct for the optical fiber.

Further regarding claim 9, slidable detector modules along rails, where at least one of the rails provides power to the detector module, is well known to the skilled artisan and an obvious modification to the typical detector structure of Vekstein.

Further regarding claim 15, the electro-optical transducers of both Vekstein and Tsang produce signals that are indicative of the signals produced by the detector elements.

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Further regarding claim 18, both Vekstein and Tsang disclose wireless transmission (optical means). Neither specifically disclose buffer memories.

However, the skilled artisan will readily appreciate the fact that buffer memories are quite common, and in fact essential, for reliably adapting to the ability of a given device to accept input data, whether it's a processor, transducer, etc. Without buffer memories, data may be lost or otherwise significantly compromised in transmission.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the prior art combination of Vekstein and Tsang to have buffer memories in conjunction with the wireless transmission in order to ensure data transfer integrity, as is known in the art.

### ***Response to Arguments***

Applicant's arguments have been fully considered but they are not persuasive. Applicants argue that a) the transmitters (LEDs) of Vekstein are not transducers, and b) the photodiodes of Vekstein do not provide input signals to the detector modules. The examiner respectfully disagrees.

First, the examiner wishes to point out that LEDs are transducers and are used as such in Vekstein. LEDs emit light as a function of the electrical input signal. The optical output relates to the electrical input, thus the signal is converted from an electrical signal to an optical signal. Therefore, Vekstein discloses electro-optic transducers as claimed in claim 1.

Second, the examiner agrees that the photodiodes on the rotor of Vekstein receive control signals that are provided "to the rotor" as Applicants state. However, the examiner wishes to point out that these control signals control all aspects of the devices located on the rotor, which

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includes the readout functions of the detector modules. Therefore, the “control signals [provided] to the rotor” in Vekstein include signals for controlling the detector modules, and thus supply “detector input signals” as claimed in claim 3.

For at least the above reasons, Applicants’ arguments are not persuasive, and the rejections have been maintained above.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS R. ARTMAN whose telephone number is (571)272-2485. The examiner can normally be reached on 9am - 5:30pm Monday - Friday.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TRA/  
Examiner, Art Unit 2882

Thomas R Artman  
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